



GEOGRAPHIC ACCESS TO REHABILITATION SERVICES FOR OEF/OIF VETERANS



FY03-FY04

MANAGEMENT REPORT

October 2007

Table of Contents

	<u>Page</u>
I. Overview of Project	5
II. VHA Polytrauma System of Care	7
III. OEF/OIF Summary	9
A. ICD-9 Codes Used to Identify Patients	
B. Characteristics of Cohorts	
C. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
D. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
E. Travel Times	
F. Potential Gaps in Rehabilitation Services	
G. Highlights	
IV. Auditory Dysfunction	17
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
V. Traumatic Amputation	21
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
VI. Burns	25
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
VII. Traumatic Brain Dysfunction	29
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
VIII. Orthopedic Impairment Group	33
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
IX. Traumatic Spinal Cord Dysfunction	37
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
X. Visual Impairment Group	41
A. Characteristics of Cohorts	
B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands	
C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands	
D. Highlights	
XI. Recommendations	45

I. OVERVIEW

Background/Rationale

With the change in modern warfare and military operations, the injuries sustained by today's soldiers are different from past military engagements. Injuries that probably would have resulted in death in earlier combat engagements are today not as lethal due to advances in military protective gear worn by the troops. As a result of greater survival, however, the returning Operation Enduring Freedom (OEF)/Operation Iraqi Freedom (OIF) veterans may have a greater need for rehabilitation due to residual deficits from traumatic injury, or polytrauma injury, than any other period of service veterans preceding them. Unfortunately, very little is known about access to rehabilitation services, rehabilitation needs or patient outcomes of OEF/OIF veterans who sustained injuries while on active duty.

Objectives

The immediate goals of the project are to identify geographic areas (1) where the need for VHA rehabilitation services is greatest, and (2) where there are potential access gaps and unmet need for such services in the returning OEF/OIF VHA patient population. The ultimate goal of the project is to assist in improving access to rehabilitation services to returning OEF/OIF veterans by disseminating information and results from this project to national program directors and decision makers in Patient Care Services and Physical Medicine & Rehabilitation Service to use in strategic planning for the distribution of scarce rehabilitation resources.

Research Questions

In this briefing we address two questions:

- What is the geographical distribution of the returning OEF/OIF cohort with potential rehabilitation needs;
- Where are the largest gaps in rehabilitation services located vis-à-vis the location of these patients?

Methods

The design is a retrospective, observational, cross-sectional study of a subgroup of OEF/OIF veterans who accessed the VA health care system during FY03 and FY04. Patients are identified, based on their International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9 CM) codes, as potential candidates for rehabilitation. Unique individuals make up the cohorts. In other words, if a veteran was identified in FY03 and used care again in FY04, he/she was counted only in the FY03 cohort not both FY03 and FY04.

The specific groups of interest in this study are veterans who have ICD-9 CM codes that are associated with traumatic brain dysfunction, traumatic spinal cord dysfunction, traumatic amputation, vision impairment, hearing impairment, orthopedic disorders, and burns. Only veterans who received services in VHA are included. We used VHA workload data sets to obtain socio-demographics and utilization information on these individuals. The analysis employs Geographic Information Systems (GIS) tools to map the location of returning war fighters in relation to where VHA rehabilitation services are available and identifies potential gaps in services. The VHA Polytrauma System of Care is comprised of four Levels. Our analyses were based on reasonable access to these varying levels. Drive time travel bands were calculated around the facilities, based on their designation of Level I-IV. Reasonable drive times were designated as: 8 hours (Level 1 Polytrauma Rehabilitation Center); 4 hours (Level II

Polytrauma Network Site); 1 hour (Level III Polytrauma Support Clinic Team); and 30 minutes (Level IV Polytrauma Point of Contact). Our analyses are based on the premise that San Juan, which is currently proposed to move to a Level II designation, will indeed have that designation in the near future. For the total FY03-FY04 cohort and for each impairment group, we calculated the percentage of VHA users inside and outside the drive time bands. The maps and tables are presented for the total cohorts and by each impairment group. Potential gaps in rehabilitation services are identified by summing patients located outside of the drive time bands to the county level. If the county contained more than 10 individuals, it was flagged as a potential underserved county.

Impact

Rehabilitation services are especially important in the VHA today given that OEF/OIF veterans are returning with service-connected traumatic brain dysfunction, traumatic spinal cord dysfunction, traumatic amputation, vision impairment, orthopedic disorders, burns and/or polytrauma injury. Despite this importance, access to specialized rehabilitation services in the VA has been shrinking. In the past ten years, the number of VA medical centers with formal inpatient rehabilitation bed units has dropped from 78 to 44, a decrease of 45 percent (PM&RS Service, 2004). Given the value of these services and the dramatic reduction in the number of specialized rehabilitation units in the VHA, it becomes critically important that the remaining VHA rehabilitation resources are located where there is the greatest need for such services. If new resources are added for rehabilitation services, it is equally important to locate services where they will have the largest impact in terms of filling service gaps and unmet need.

Research Support

This research was supported by the VHA Health Services Research and Development Service, VHA Office of Research and Development as grant number DHI 06-010-1.

Research Investigators

Diane C. Cowper Ripley, PhD, Principal Investigator
Dean Reker, RN, PhD, Co-Investigator
W. Bruce Vogel, PhD, Co-Investigator,
Rebecca Beyth, MD, MSc, Co-investigator.
Jeanne Hayes, PhD, Co-Investigator,
Barbara Sigford, MD, PhD Co-investigator
Sam Wu, PhD, Statistician

Consultants

Douglas Bidelspach, MPT
Cliff Marshall, MS
Gretchen Stephen, PhD

Project Staff

Lloyd Dewald, MS
Eric R. Litt, BA
Xinping Wang, PhD

Contact Information:

Diane C. Cowper Ripley, PhD, Principal Investigator
RORC/Research Service (151B)
NF/SG Veterans Health System
1601 SW Archer Road
Gainesville, FL 32608

Telephone: (352) 376-1611, x4929

E-mail: Diane.Cowper2@va.gov

II. VHA Polytrauma System of Care

VHA Physical Medicine and Rehabilitation Service provided information on the level of rehabilitation care available in VA facilities across the nation that comprises the VHA Polytrauma System of Care (Map 1). There are four levels of care designated.

Level I sites are referred to as Polytrauma Rehabilitation Centers (PRCs). These facilities provide acute, comprehensive, inpatient rehabilitation. They maintain a full team of dedicated rehabilitation professionals and consultants from other specialties related to polytrauma. The Centers serve as consultants to other facilities in the Polytrauma System of Care.

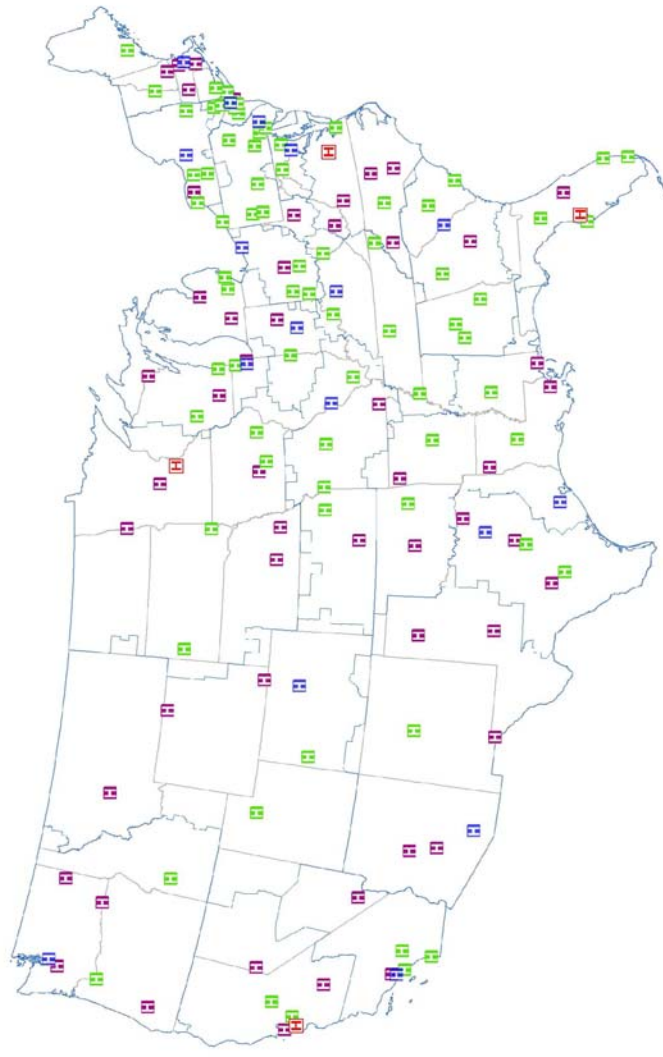
Polytrauma Network Sites (Level II) provide specialized, post-acute rehabilitation in consultation with the Rehabilitation Centers in a setting appropriate to the needs of veterans, service members, and families. These Network Sites provide proactive case management for existing and emerging conditions and identify local resources for VA and non-VA care.

Polytrauma Support Clinic Teams (Level III) are groups of rehabilitation providers who deliver follow-up services in consultation with regional and network specialists. They assist in managing the long-term effects of Polytrauma through direct care, consultation, and the use of tele-rehabilitation technologies where appropriate.

The Polytrauma Point of Contact (Level IV) facilities provide referrals to higher level rehabilitation services as needed.

This extensive network of facilities encompasses all fifty states and a proposed Level II site in San Juan, Puerto Rico.

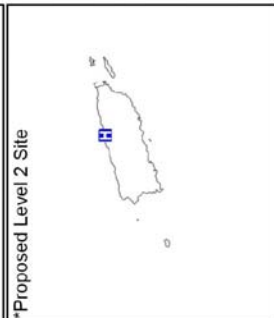
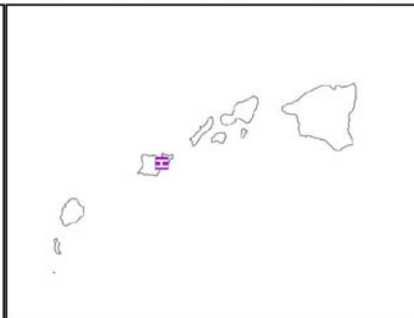
Map 1: VHA Polytrauma System of Care, FY-2007



Legend

- Level 1 Polytrauma Site
- Level 2 Polytrauma Site
- Level 3 Polytrauma Site
- Level 4 Polytrauma Site

Map Created By: Eric Litt
 Map Information Provided By: Physical Medicine and Rehabilitation Service
 Funding Source: HSR&D Service, VHA Office of Research and Development
 Project # DHI 06-010-1
 Map Creation Date: June 11, 2007
 ArcMap 9.2



III. OEF/OIF Traumatically Injured Veterans: Summary

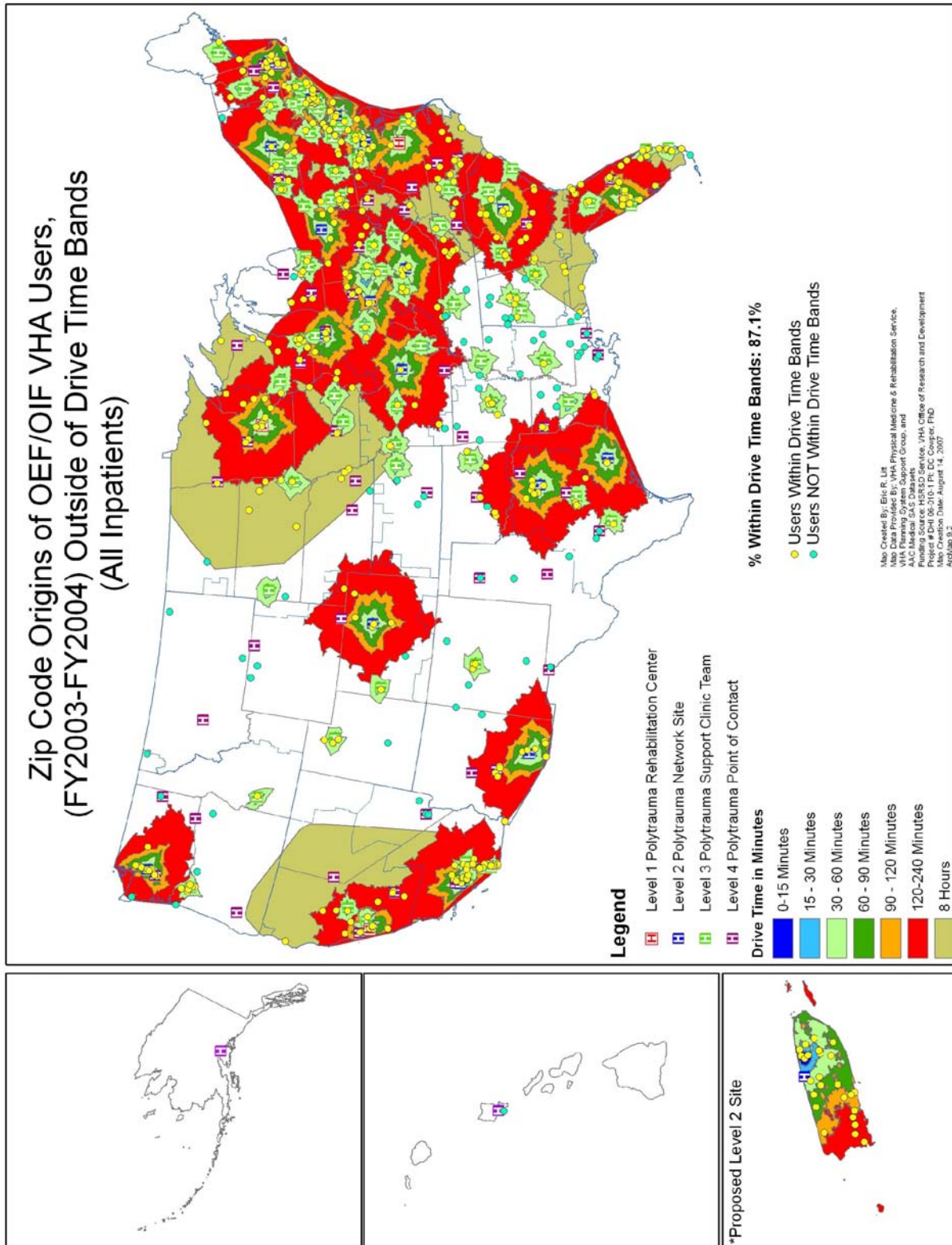
A. ICD-9 CM Codes Used to Identify Patients

Table 1 provides the specific International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) codes used to identify the FY03 and FY04 cohorts from the VHA's Medical SAS inpatient, outpatient, and extended care files.

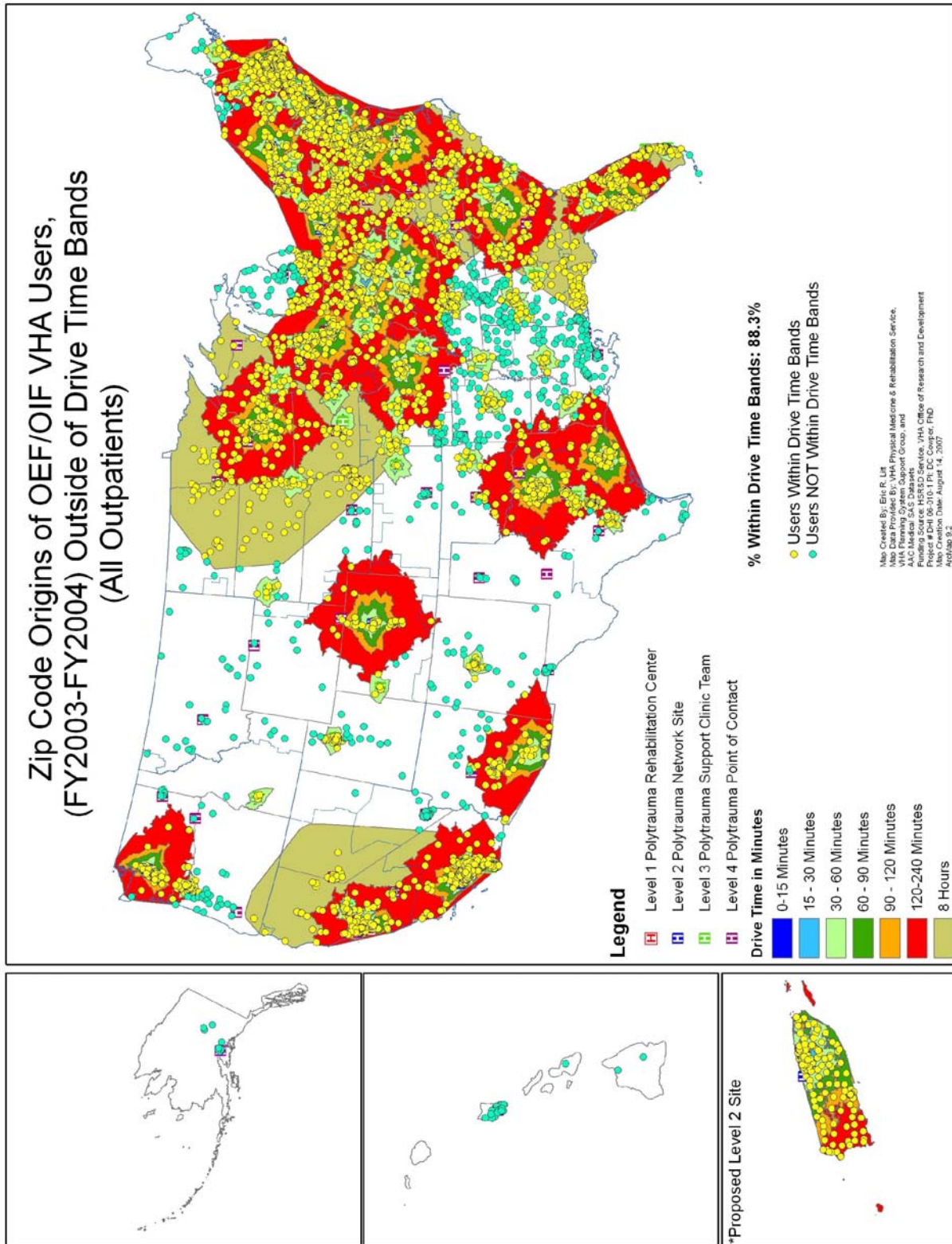
Impairment Group	ICD-9-CM Codes
Traumatic Brain Dysfunction Open	800.50-800.99, 801.50-801.99, 803.50-803.99, 804.50-804.99, 851.10-851.99, 852.10-852.59, 853.10-853.19, 854.10-854.19, 905.0
Closed	310.2, 800.00-800.49, 801.00-801.49, 803.00-803.49, 804.00-804.49, 851.00-851.89, 852.00-852.49, 853.00-853.09, 854.00-854.09, 905.0, 907.0
Traumatic Spinal Cord Dysfunction	806.00-806.9, 907.2, 907.3, 952.00-952.9, 953.0-953.9
Traumatic Amputation	887.0-887.7, 896.0-896.3, 897.0-897.7, 905.9, E878.5, V49.6, V49.7
Burns	941.00-941.59, 942.00-941.59, 943.00-943.59, 944.00-944.59, 945.00-945.59, 946.00-946.59, 947.00-947.59, 948.00-948.59
Legal Blindness/Visual Impairment	369.01, 369.02, 369.05, 369.11, 369.4, 369.15, 368.9, 367.9
Orthopedic Disorders	820.00-820.9, 821.00-821.39, 808.8-808.9, 827-828, 823.00-823.92, 839.00-839.9, 905.1-905.6
Auditory Dysfunction	384.2x, 385.23, 386.53-386.56, 388.11, 388.12, 388.31, 388.32, 388.42-388.44, 388.71, 388.72, 389.01-389.04, 389.11, 389.12, 389.14, 389.15, 389.16, 389.18, 389.2, 872.00, 872.01, 872.02, 872.10-872.12, 872.61-872.64, 872.69, 872.71-872.74, 872.79, 872.9

B. Characteristics of OEF/OIF Cohorts			
VARIABLE TYPE	FY03 N=1,923	FY04 N=5,917	Combined N=7,842
<i>Impairment Group (N, %)*</i>			
Traumatic Brain Dysfunction	88 (4.6%)	244 (4.1%)	332 (4.2%)
Open	13 (.68%)	50 (.84%)	63 (.80%)
Closed	87 (4.5%)	241 (4.1%)	328 (4.2%)
Traumatic Spinal Cord Dysfunction	48 (2.5%)	77 (1.3%)	125 (1.6%)
Traumatic Amputation	24 (1.3%)	78 (1.3%)	102 (1.3%)
Burns	58 (3.0%)	110 (1.9%)	168 (2.1%)
Visual Impairment	587 (30.5%)	1,600 (27.0%)	2,187 (27.9%)
Orthopedic	100 (5.2%)	307 (5.2%)	407 (5.2%)
Auditory Dysfunction	1,115 (58.0%)	3,865 (65.3%)	4,980 (63.5%)
Number of Polytrauma Patients	91 (4.7%)	336 (5.7%)	427 (5.4%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	1,767 (91.9%)	5,456 (92.2%)	7,223 (92.1%)
Mean Age (standard deviation)	38.1 (10.5)	34.9 (10.5)	35.6 (10.6)
Age Categories (N/%)			
Less than 25	298 (15.5%)	1,421 (24.0%)	1,719 (21.9%)
25 – 34	407 (21.2%)	1,536 (26.0%)	1,943 (24.8%)
35 – 44	655 (34.1%)	1,768 (29.9%)	2,423 (30.9%)
45 – 54	455 (23.7%)	991 (16.7%)	1,446 (18.4%)
55 and over	108 (5.6%)	203 (3.4%)	311 (4.0%)
Race			
White	1,259 (65.5%)	3,849 (65.0%)	5,108 (65.1%)
Black	260 (13.5%)	772 (13.0%)	1,032 (13.2%)
Hispanic	299 (15.5%)	1,002 (16.9%)	1,301 (16.6%)
Other	58 (3.0%)	175 (3.0%)	233 (3.0%)
Missing	47 (2.4%)	121 (2.0%)	168 (2.4%)
<i>Distance</i>			
Median Dist. to nearest VA facility	21 miles	23 miles	22 miles
Median Distance to nearest Level 3	58 miles	66.3 miles	64 miles
Median Distance to nearest Level 2	118 miles	121 miles	121 miles
Median Distance to nearest Level 1	411 miles	411 miles	411 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	180	561	741
% rehabilitation	21.1%	18.9%	19.0%
Outpatient Visits (Total)	1,795	66,948	82,821
% rehabilitation	11.3%	10.9%	11.0%
*Total of categories can exceed total N because some veterans had multiple conditions/injuries			

C. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04



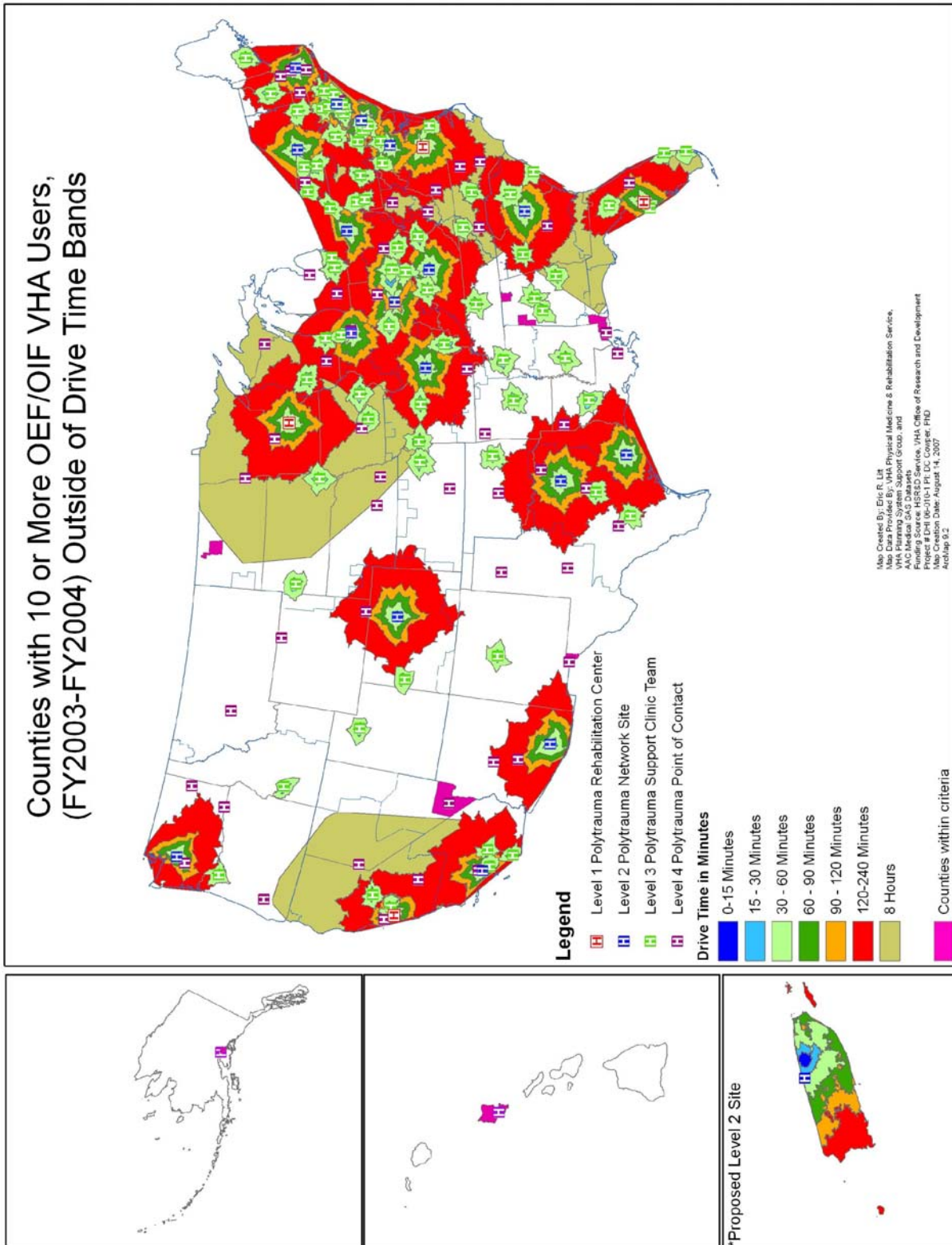
D. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04



E. Percent in Travel Time Breakdown by Impairment Group, FY03 & FY04								
Impairment Group	15 Min.	30 Min.	60 Min.	90 Min.	120 Min.	240 Min.	480 Min.	Outside Time Bands
Audio (inpatient)	12%	23%	19%	3%	9%	14%	7%	13%
Audio (outpatient)	10%	16%	25%	5%	5%	16%	12%	11%
Burns (inpatient)	21%	16%	5%	0%	5%	16%	16%	21%
Burns (outpatient)	21%	15%	24%	5%	2%	14%	5%	13%
Ortho (inpatient)	8%	16%	18%	8%	8%	21%	8%	12%
Ortho (outpatient)	10%	17%	23%	4%	7%	18%	6%	14%
Spinal Cord Dysfunction (inpatient)	13%	20%	24%	3%	4%	24%	7%	7%
Spinal Cord Dysfunction (outpatient)	10%	18%	23%	3%	6%	21%	7%	11%
Traumatic Amputation (inpatient)	12%	8%	16%	4%	0%	32%	8%	20%
Traumatic Amputation (outpatient)	12%	12%	19%	1%	4%	20%	7%	25%
Traumatic Brain Dysfunction (inpatient)	10%	14%	25%	4%	4%	21%	9%	14%
Traumatic Brain Dysfunction (outpatient)	13%	18%	22%	4%	4%	21%	6%	13%
Visual (inpatient)	12%	16%	28%	6%	8%	14%	3%	13%
Visual (outpatient)	11%	16%	23%	8%	10%	17%	3%	12%

Drive time travel bands were calculated around the facilities, based on their designation of Level I-IV. Reasonable drive times were designated as: 8 hours (Level I Polytrauma Rehabilitation Center); 4 hours (Level II Polytrauma Network Site); 1 hour (Level III Polytrauma Support Clinic Team); and 30 minutes (Level IV Polytrauma Point of Contact). Thus, to interpret the information in the table above, the 15 and 30 minute timeframe could refer to any level (I – IV) of rehabilitation. The 60 minutes refers to access to Levels I, II, or III; 120 and 240 minutes captures only Level I and Level II facilities and 480 is only applicable to Level I Polytrauma Rehabilitation Centers.

F. Potential Gaps in Rehabilitation Services



Counties Identified with Potential Service Gaps

<u>County and State</u>	<u>N outside drive time bands</u>
1. Clark, Nevada	75
2. El Paso, Texas	31
3. Anchorage, Alaska	25
4. Marion, Alabama	25
5. Honolulu, Hawaii	24
6. Lamar, Alabama	23
7. Mobile, Alabama	23
8. Harrison, Mississippi	17
9. Jackson, Mississippi	14
10. Madison, Alabama	12
11. Ward, North Dakota	12

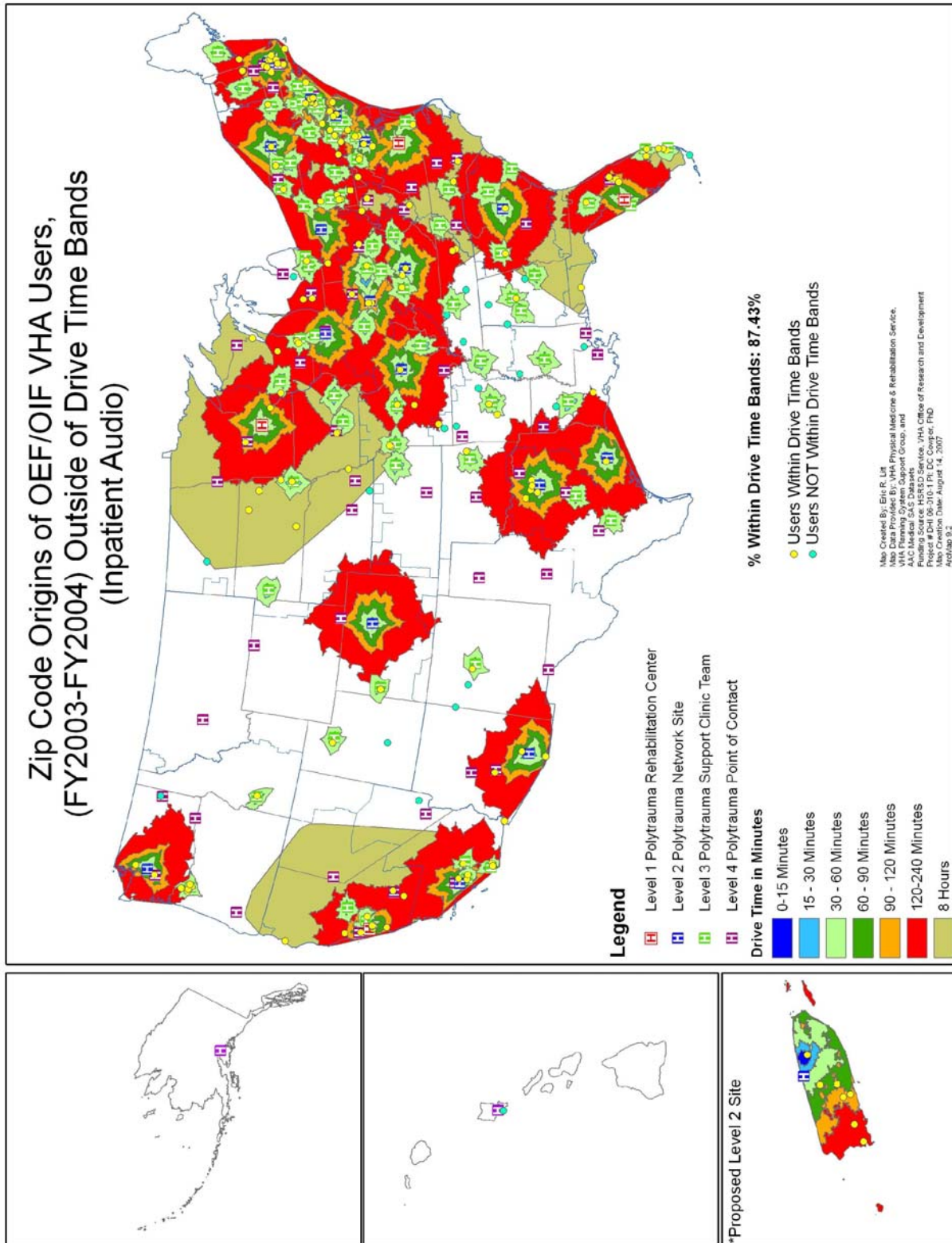
G. Highlights

- 7,842 individuals were identified in the combined FY2003-FY2004 cohort
- Auditory Dysfunction was the most common traumatic injury, with 63.5% of the cohort having a diagnostic code in this group; Visual Impairment was the second most common (27.9%) followed by: Orthopedic (5.2%), Traumatic Brain Dysfunction (4.2%), Burns (2.1%), Spinal Cord Injury (1.6%), and Amputation (1.3%)
- 427, or 5.4%, in the cohort suffered polytraumatic injuries
- The mean age was 35.6 years
- 311 (4%) of those traumatically injured were 55 years of age and older
- Approximately eight percent (7.9%) of the combined cohort were women
- White race is the majority of those individuals identified with traumatic injury (65.1%); 16.5% were hispanic and 13.2% were African Americans
- Median distance to Level I, Level II, and Level III facility was 411 miles, 121 miles, and 64 miles respectively
- The median distance to the closest VA facility was 22 miles
- VHA Polytrauma System of Care provided reasonable rehabilitation access to 87.1% of inpatient and 88.3% of outpatient users of VHA services for the FY03 & FY04 cohorts
- Impairment groups where 20% or more of patients were outside of reasonable drive time were: inpatient burns (21%), inpatient traumatic amputation (20%) and outpatient traumatic amputation (25%)
- Following the health care utilization of each patient for a 12 month period, there were 741 inpatient episodes of care and 82,821 outpatient visits to the VHA generated
- Four counties in Alabama (Marion, Lamar, Madison, and Mobile) and 1 county in each of the following states: Nevada (Clark), North Dakota (Ward), Texas (El Paso), Hawaii (Honolulu), Alaska (Anchorage), and Mississippi (Jackson) were identified as areas with potential rehabilitation access gaps
- Clark County, Nevada and El Paso County, Texas had the highest number of patients outside of the drive time bands

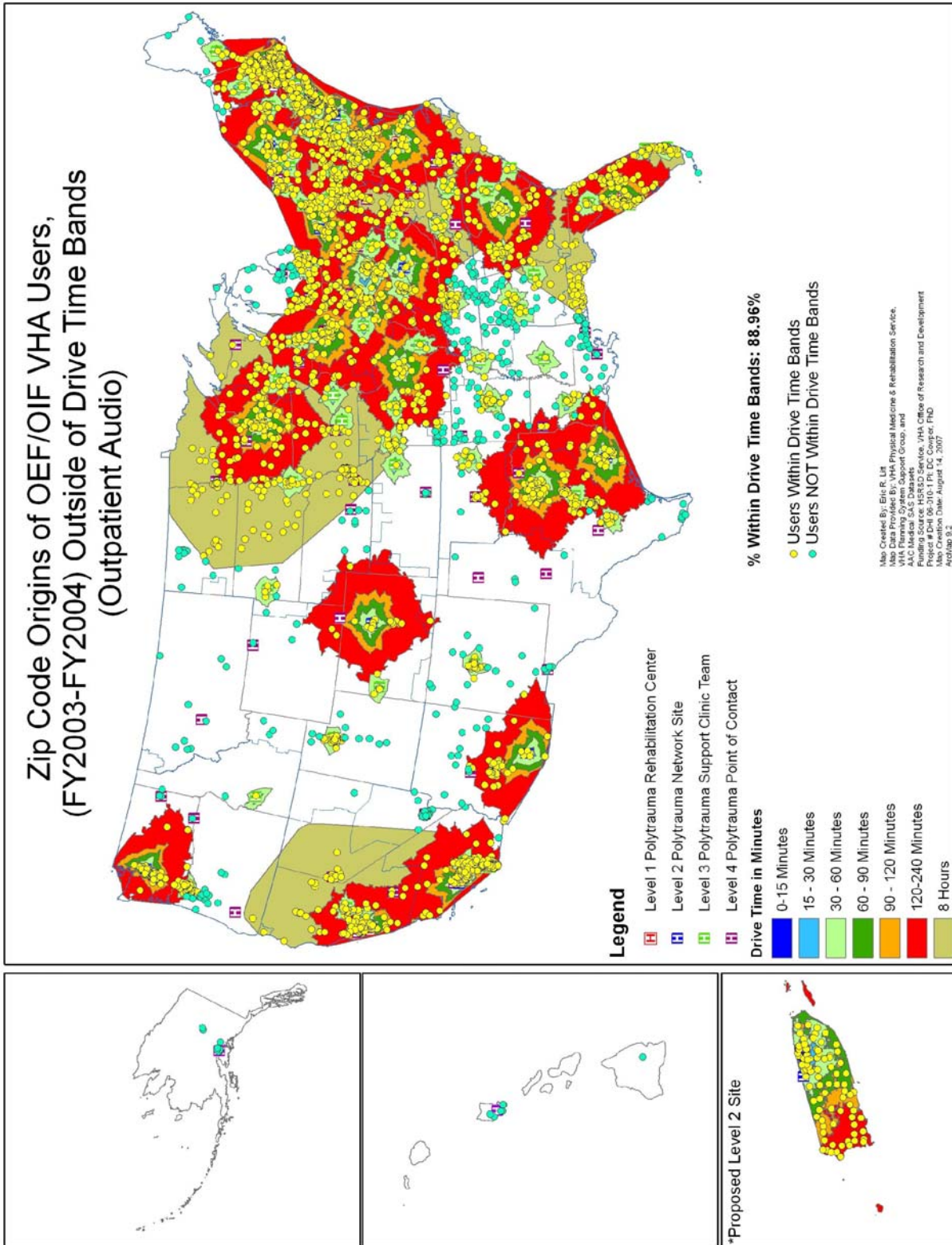
IV. Auditory Dysfunction

A. Characteristics of OEF/OIF Cohorts: Auditory Dysfunction Group			
VARIABLE TYPE	FY03 N=1,115	FY04 N=3,865	Combined N=4,980
Number of Traumatic Injuries			
1 (Audio)	1,049 (94.1%)	3,594 (93.0%)	4,643 (93.2%)
2 (Audio + 1 additional)	61 (5.5%)	256 (6.6%)	317 (6.4%)
3 (Audio + 2 additional)	5 (.45%)	13 (.34%)	18 (.36%)
4 (Audio + 3 additional)	0	2 (.05%)	2 (.04%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	1,044 (93.6%)	3,643 (94.3%)	4,687 (94.1)%
Mean Age (standard deviation)	39.2 years (10.2)	35.5 years (10.5)	36.4 years (10.5)
Age Categories (N/%)			
Less than 25	136 (12.2%)	832 (21.5%)	968 (19.4%)
25 – 34	210 (18.8%)	975 (25.2%)	1,185 (23.8%)
35 – 44	428 (38.4%)	1,231 (31.9%)	1,659 (33.3%)
45 – 54	264 (23.7%)	666 (17.2%)	930 (18.7%)
55 and over	77 (6.9%)	161 (4.2%)	238 (4.8%)
Race			
White	851 (76.3%)	2,888 (74.7%)	3,739 (75.1%)
Black	107 (9.6%)	365 (9.4%)	472 (9.5%)
Hispanic	96 (8.6%)	401 (10.4%)	497 (10.0%)
Other	31 (2.8%)	117 (3.0%)	148 (3.0%)
Missing	30 (2.7%)	94 (2.4%)	124 (2.5%)
<i>Distance</i>			
Median Dist. to nearest VA facility	22 miles	23 miles	22 miles
Median Distance to nearest Level 3	48.9 miles	57.2 miles	55 miles
Median Distance to nearest Level 2	122 miles	126 miles	125 miles
Median Distance to nearest Level 1	392.3 miles	397 miles	396 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	38	163	201
% rehabilitation	10.5%	8.0%	8.5%
Outpatient Visits (Total)	7,082	37,468	44,550
% rehabilitation	7.3%	8.8%	8.5%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Audiology)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Audiology)



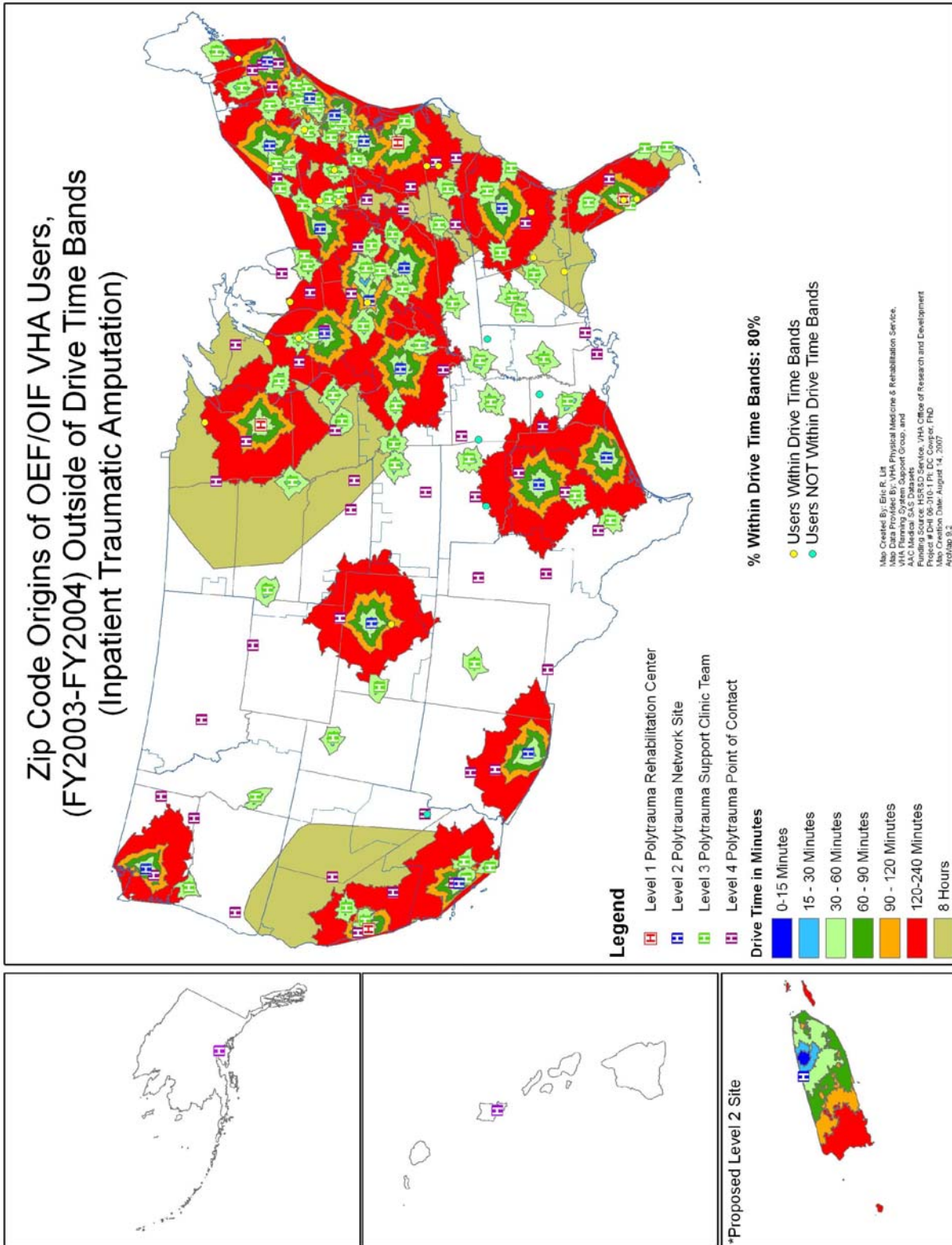
D. Highlights

- This was the largest impairment group in the FY03-FY04 combined cohort; 4,980 of 7,842 (63.5%) OEF/OIF returnees presented to the VHA with a diagnostic code in auditory dysfunction
- Most OEF/OIF veterans with hearing impairment had that as a single trauma (93.2%)
- Approximately 6% in this impairment group was female
- The mean age of those with auditory diagnoses was 36.4 years of age
- Two-hundred thirty-eight (4.8%) with auditory impairment were in the age group 55 years and older
- Three-quarters (75.1%) of patients with traumatic injury in this impairment group were white; approximately one-quarter was minority.
- The median distance to the nearest Level III designated facility was 55 miles
- The median distance to the nearest Level II designated facility was 125 miles
- The median distance to the nearest Level 1 designated facility was 396 miles
- Eight-seven percent (87%) of auditory dysfunction inpatients and 89% outpatients were in reasonable driving time to rehabilitation services

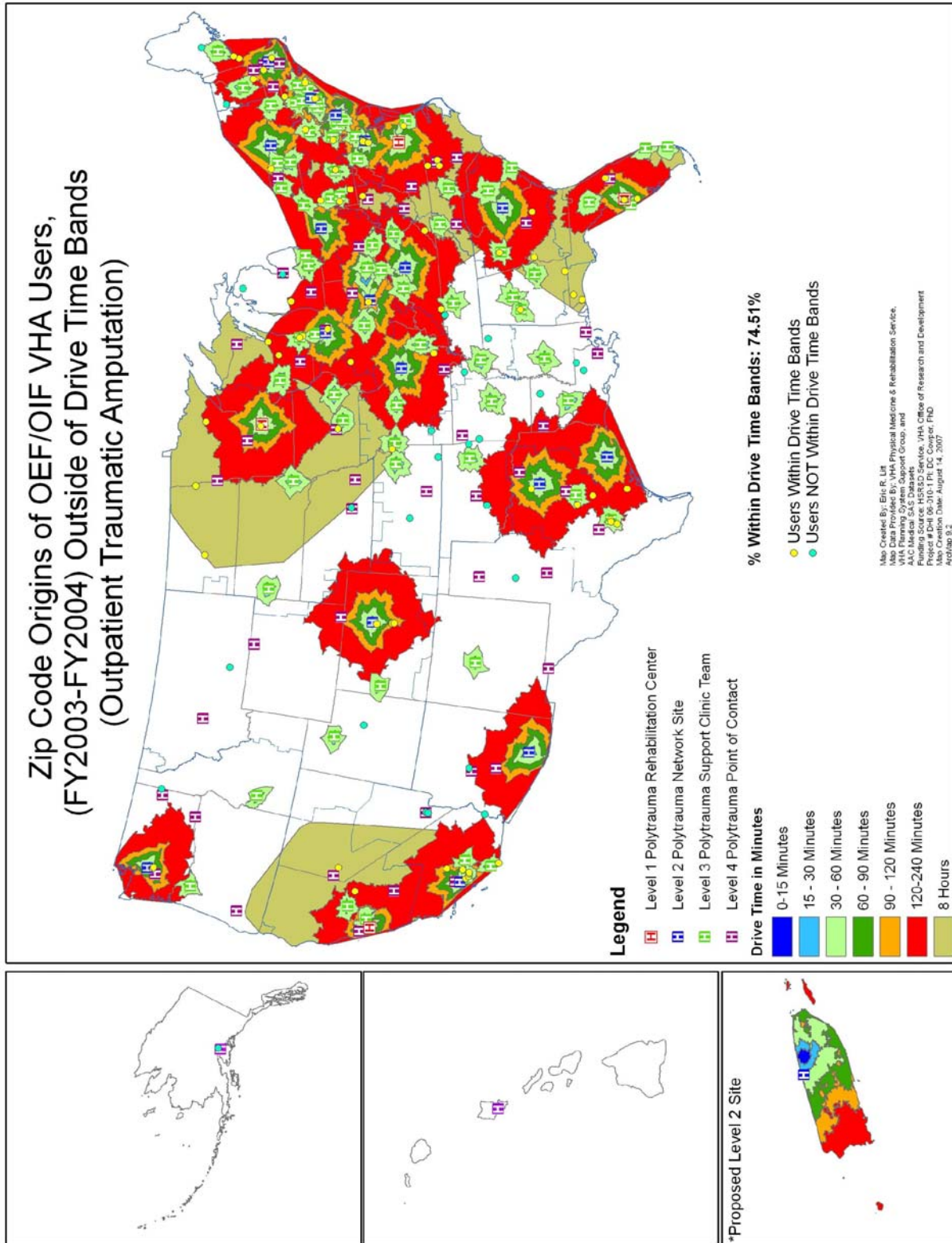
V. Traumatic Amputation

A. Characteristics of OEF/OIF Cohorts: Amputation Impairment Group			
VARIABLE TYPE	FY03 N=24	FY04 N=78	Combined N=102
Number of Traumatic Injuries			
1 (AMPUTATION)	14 (58.3%)	52 (66.7%)	66 (64.7%)
2 (AMPUTATION + 1)	7 (29.2%)	23 (29.5%)	30 (29.4%)
3 (AMPUTATION + 2)	3 (12.5%)	2 (2.6%)	5 (4.9%)
4 (AMPUTATION + 3)	0	1 (1.3%)	1 (1.0%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	24 (100.0%)	73 (93.6%)	97 (95.1%)
Mean Age (standard deviation)	29.2 years (10.5)	27.3 years (6.8)	27.7 years (7.8)
Age Categories (N/%)			
Less than 25	11 (45.8%)	37 (47.4%)	48 (47.1%)
25 – 34	7 (29.2%)	30 (38.5%)	37 (36.3%)
35 – 44	4 (16.7%)	10 (12.8%)	14 (13.7%)
45 – 54	1 (4.2%)	0	1 (1.0%)
55 and over	1 (4.2%)	1 (1.3%)	2 (2.0%)
Race			
White	19 (79.2%)	65 (83.3%)	84 (82.4%)
Black	2 (8.3%)	7 (9.0%)	9 (8.8%)
Hispanic	2 (8.3%)	5 (6.4%)	7 (6.9%)
Other	1 (4.2%)	0	1 (1.0%)
Missing	0	1 (1.3%)	1 (1.0%)
<i>Distance</i>			
Median Dist. to nearest VA facility	38.0 miles	26.0 miles	28.0 miles
Median Distance to nearest Level 3	45.0 miles	71.0 miles	65.0 miles
Median Distance to nearest Level 2	126.0 miles	183.0 miles	168.0 miles
Median Distance to nearest Level 1	398.0 miles	395.0 miles	395.0 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	16	29	45
% rehabilitation	31.3%	31.0%	31.1%
Outpatient Visits (Total)	492	1,164	1,656
% rehabilitation	22.0%	20.6%	21.0%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Amputation)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Amputation)



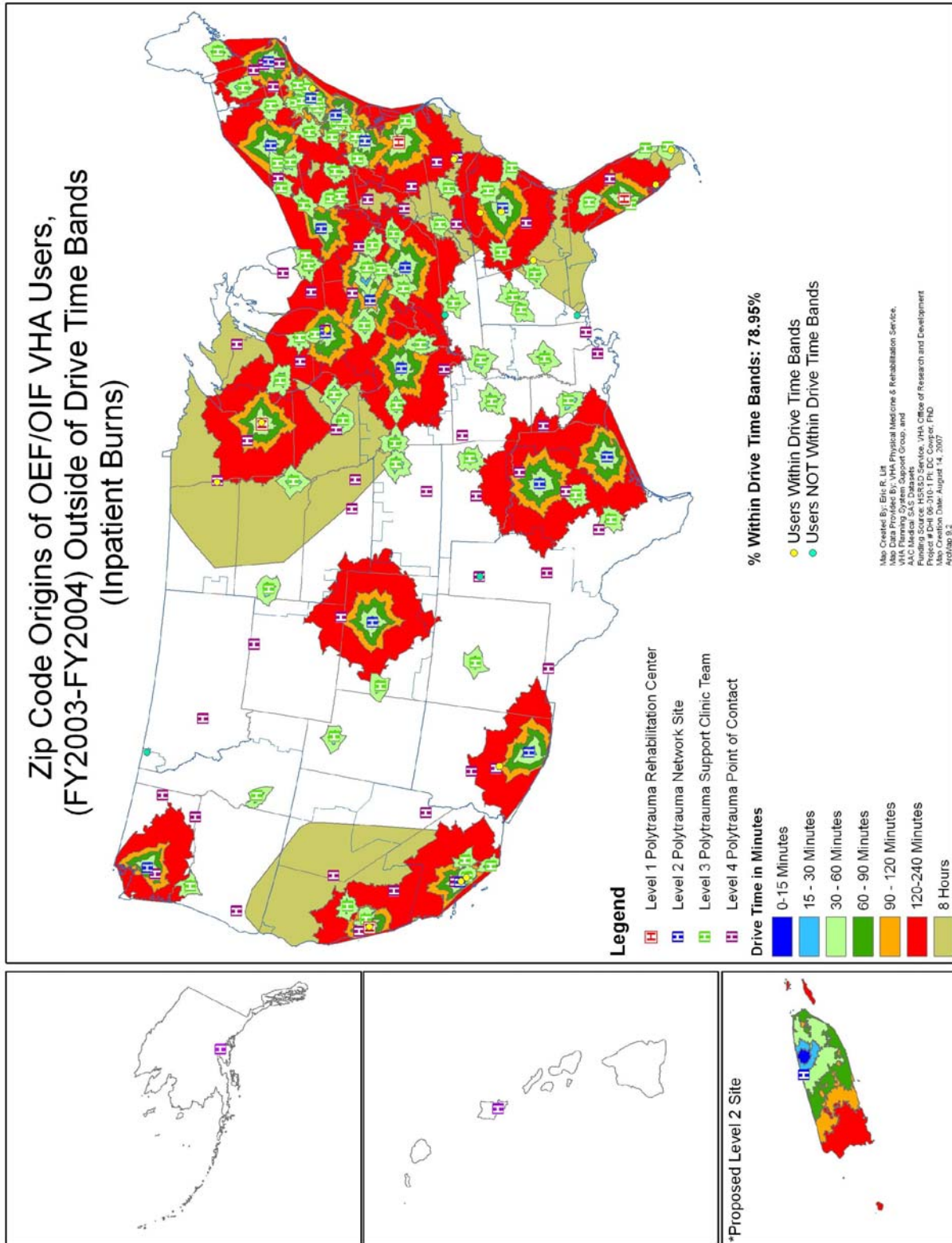
D. Highlights

- Patients with traumatic amputation had a high rate of polytrauma. Thirty-six (36) of the 102, or 35.3%, had diagnostic codes in amputation plus one or more of the other traumatic injuries under review
- Most traumatic amputations happened to males (95.1%)
- The mean age for this traumatic injury was 27.7 years
- While only about 22% of the FY03-FY04 combined cohort are under the age of 25 years, individuals less than 25 years of age represent 47.1% of the traumatic amputations
- 82.4% in this group was white
- While the overall number is small (102), the group as a whole had 45 hospitalizations and generated 1,656 outpatient visits.
- Using discharge bed section codes of 20 (Rehabilitation Medicine), 41 (Rehabilitation Medicine Observation), or 35 (GEM Rehabilitation) to indicate receipt of rehabilitation, approximately one-third of these episodes had inpatient rehabilitation
- One-fifth (21.0%) of all outpatient visits included either a rehabilitation clinic or seeing a rehabilitation professional
- Eighty percent (80%) of inpatients and 75% of outpatients with traumatic amputation were in reasonable drive time to rehabilitation services

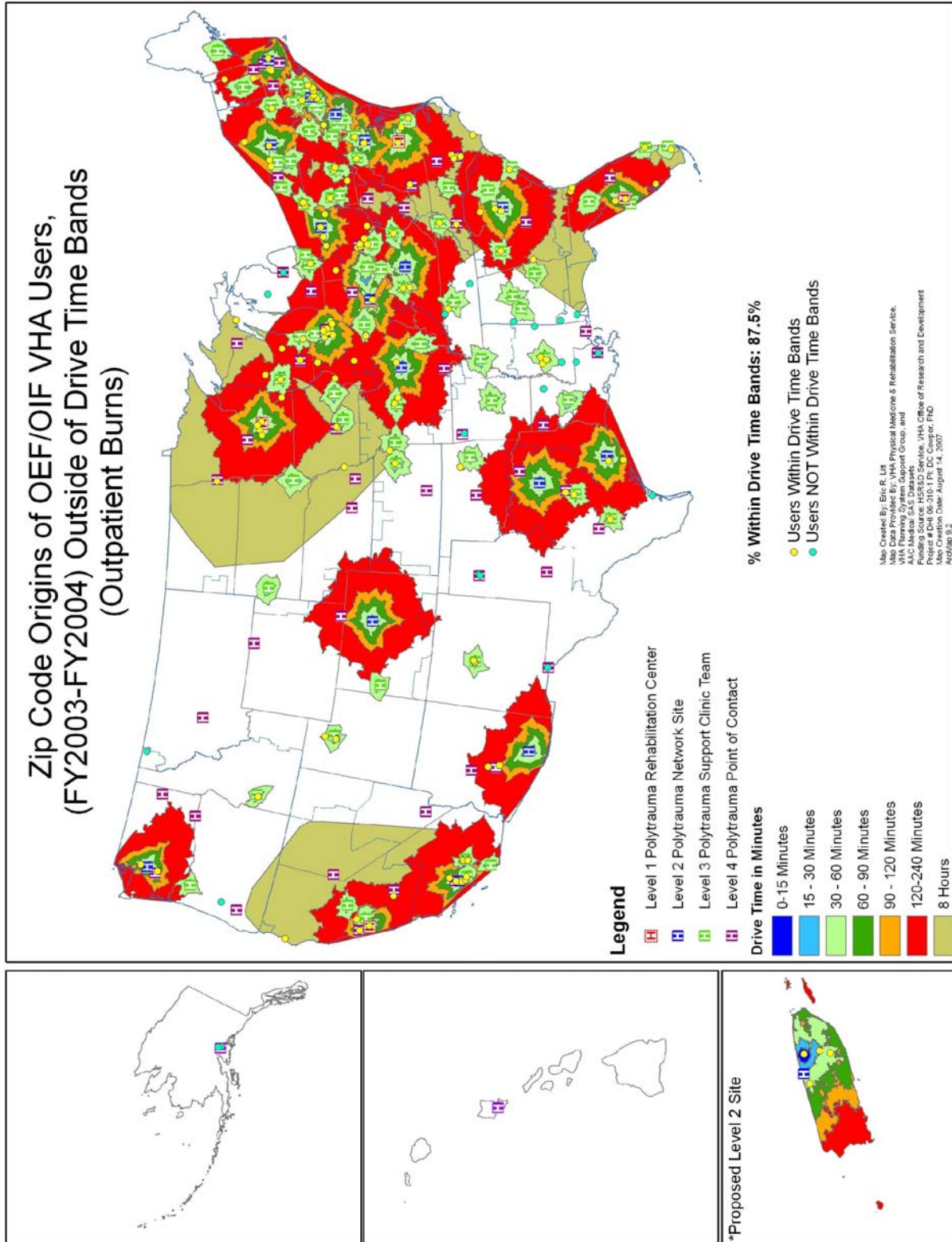
VI. Burns

A. Characteristics of OEF/OIF Cohorts: Burns Impairment Group			
VARIABLE TYPE	FY03 N=58	FY04 N=110	Combined N=168
Number of Traumatic Injuries			
1 (Burns)	51 (87.9%)	92 (83.6%)	143 (85.1%)
2 (Burns + 1 additional)	5 (8.6%)	12 (10.9%)	17 (10.1%)
3 (Burns + 2 additional)	2 (3.5%)	6 (5.5%)	8 (4.8%)
4 (Burns + 3 additional)	0	0	0
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	48 (82.8%)	91 (82.7%)	139 (82.7%)
Mean Age (standard deviation)	31.2 years (10.0)	28.4 years (7.8)	29.4 years (8.7)
Age Categories (N/%)			
Less than 25	18 (31.0%)	46 (41.8%)	64 (38.1%)
25 – 34	24 (41.4%)	39 (35.5%)	63 (37.5%)
35 – 44	8 (13.8%)	21 (19.1%)	29 (17.3%)
45 – 54	6 (10.3%)	3 (2.7%)	9 (5.4%)
55 and over	2 (3.5%)	1 (.91%)	3 (1.8%)
Race			
White	39 (67.2%)	71 (64.6%)	110 (65.5%)
Black	8 (13.8%)	22 (20.0%)	30 (17.9%)
Hispanic	8 (13.8%)	14 (12.7%)	22 (13.1%)
Other	2 (3.5%)	3 (2.7%)	5 (3.0%)
Missing	1 (1.7%)	0	1 (.60%)
<i>Distance</i>			
Median Dist. to nearest VA facility	19.0 miles	11.0 miles	11.0 miles
Median Distance to nearest Level 3	49.0 miles	45.0 miles	47.3 miles
Median Distance to nearest Level 2	134.5 miles	139.5 miles	137.0 miles
Median Distance to nearest Level 1	351.6 miles	346.0 miles	350.0 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	6	23	29
% rehabilitation	33.3%	4.3%	10.3%
Outpatient Visits (Total)	508	1,827	2,335
% rehabilitation	16.3%	17.0%	16.9%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Burns)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Burns)



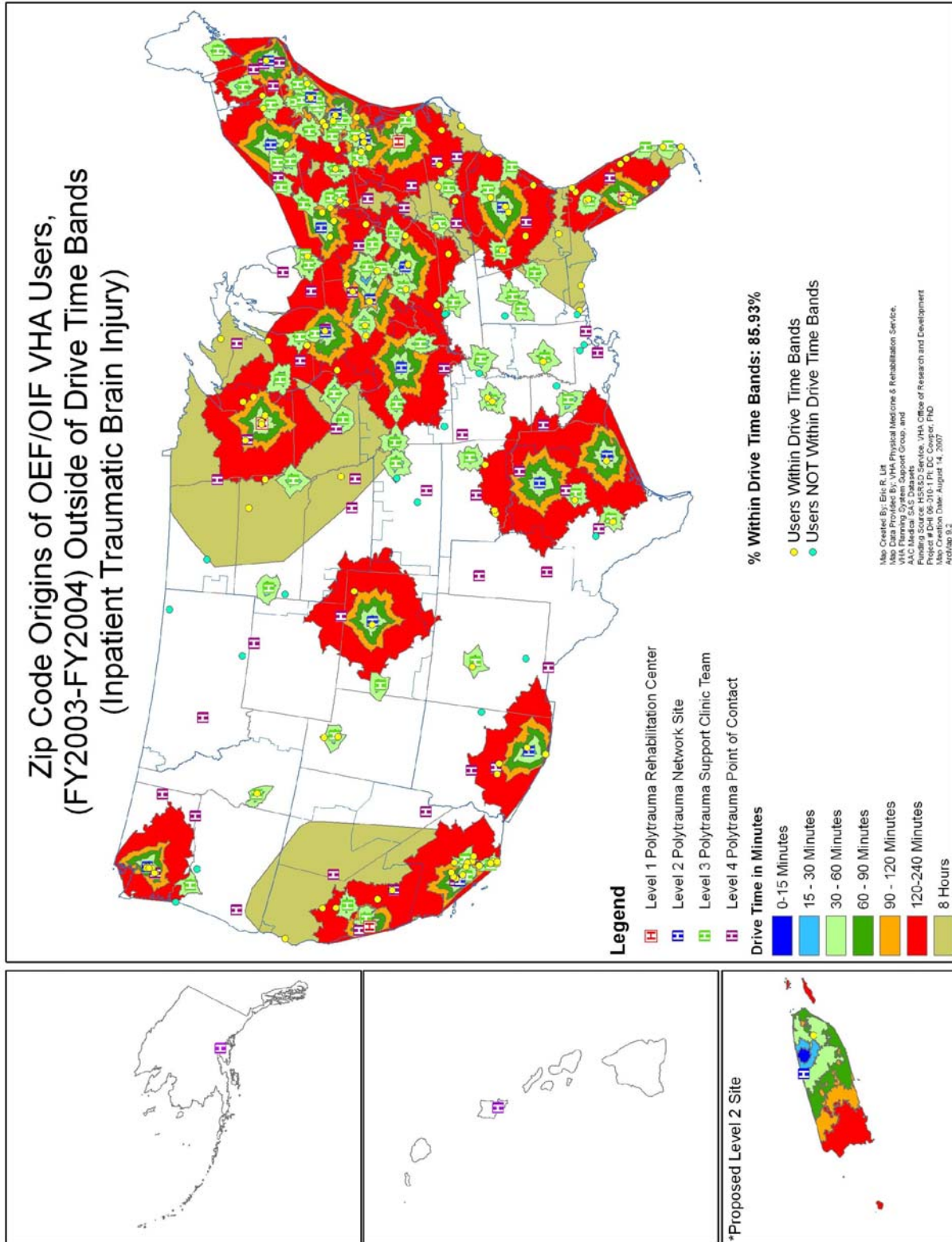
D. Highlights

- While representing only 7.9% of all traumatically injured patients in the FY03-FY04 combined cohort, females represent a relatively large percentage of patients in the burn impairment group (17.3%)
- Three-quarters (75.6%) of burn patients are less than 35 years of age
- The mean age of this impairment group is 29.4 years
- Whites represent 65.5% of this group; 17.9% is African-American and 13.1% is Hispanic
- Median distance to the nearest VA Medical Center for this group is 11.0 miles
- Twenty-nine (29) inpatient episodes and 2,335 outpatient visits were generated by this group in the 12 month follow-up period
- Inpatients and outpatients within reasonable time was 79% and 87% respectively for this impairment group

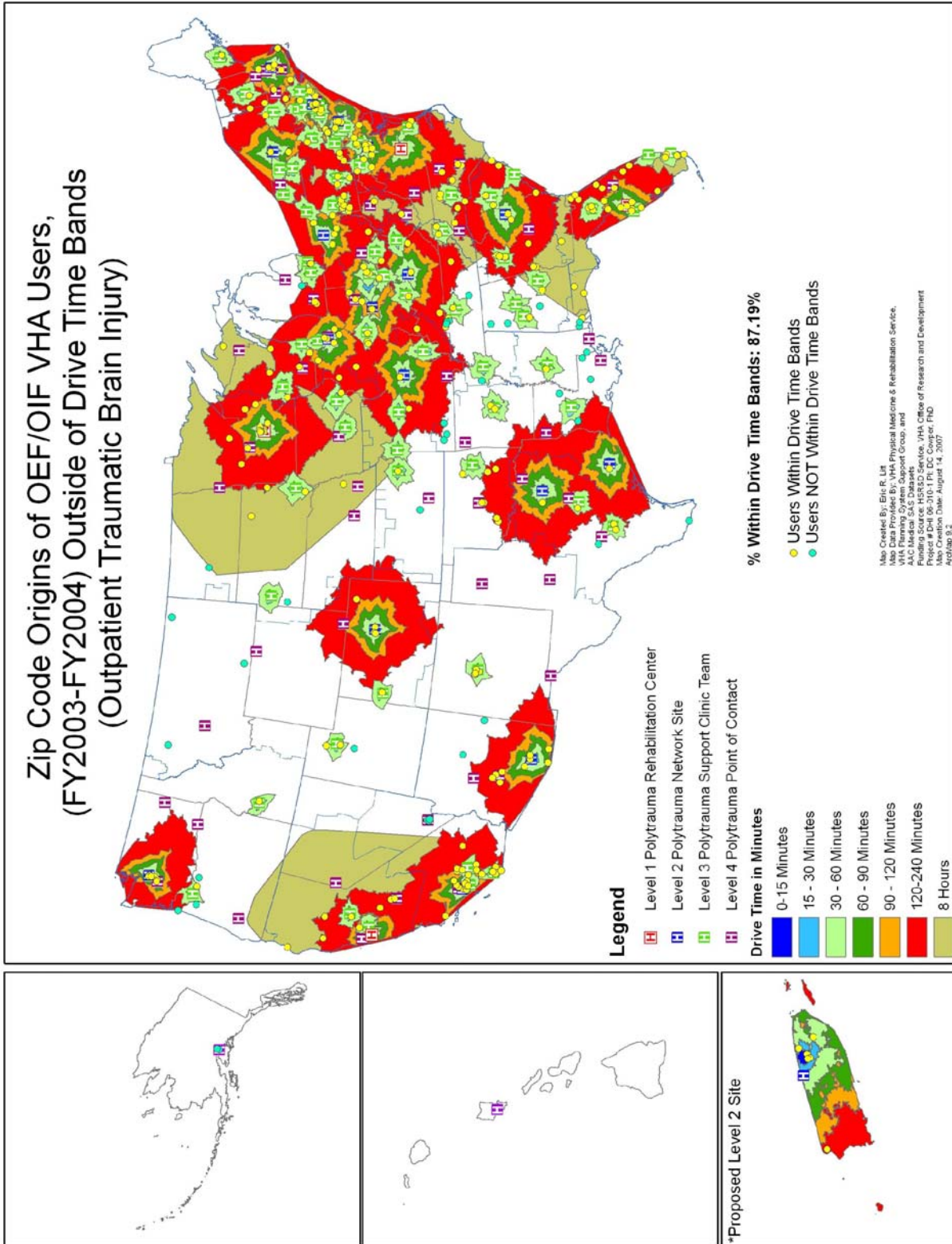
VII. Traumatic Brain Dysfunction

Characteristics of OEF/OIF Cohorts: TBI Impairment Group			
VARIABLE TYPE	FY03 N=88	FY04 N=244	Combined N=332
Number of Traumatic Injuries			
1 (TBI)	67 (76.1%)	172 (70.5%)	239 (72.0%)
2 (TBI + 1 additional)	18 (20.5%)	57 (23.4%)	75 (22.6%)
3 (TBI + 2 additional)	3 (3.4%)	12 (4.9%)	15 (4.5%)
4 (TBI + 3 additional)	0	3 (1.2%)	3 (.9%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	80 (90.9%)	230 (94.3%)	310 (93.4%)
Mean Age (standard deviation)	30.3 years (9.8)	28.6 years (8.5)	29.1 (8.9)
Age Categories (N/%)			
Less than 25	35 (39.8%)	115 (47.1%)	150 (45.2%)
25 – 34	26 (29.6%)	66 (27.1%)	92 (27.7%)
35 – 44	18 (20.5%)	49 (20.1%)	67 (20.2%)
45 – 54	8 (9.1%)	13 (5.3%)	21 (6.3%)
55 and over	1 (1.1%)	1 (.41%)	2 (.6%)
Race			
White	61 (69.3%)	167 (68.4%)	228 (68.7%)
Black	8 (9.1%)	35 (14.3%)	43 (13.0%)
Hispanic	12 (13.6%)	24 (9.8%)	36 (10.8%)
Other	5 (5.7%)	11 (4.5%)	16 (4.8%)
Missing	2 (2.3%)	7 (2.9%)	9 (2.7%)
<i>Distance</i>			
Median Dist. to nearest VA facility	17.5 miles	22.8 miles	22 miles
Median Distance to nearest Level 3	42.5 miles	50 miles	47.5 miles
Median Distance to nearest Level 2	132 miles	121 miles	125 miles
Median Distance to nearest Level 1	351 miles	351 miles	351 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	64	186	250
% rehabilitation	54.7%	49.5%	50.8%
Outpatient Visits (Total)	1,386	4,126	5,512
% rehabilitation	23.0%	25.2%	24.6%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (TBI)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (TBI)



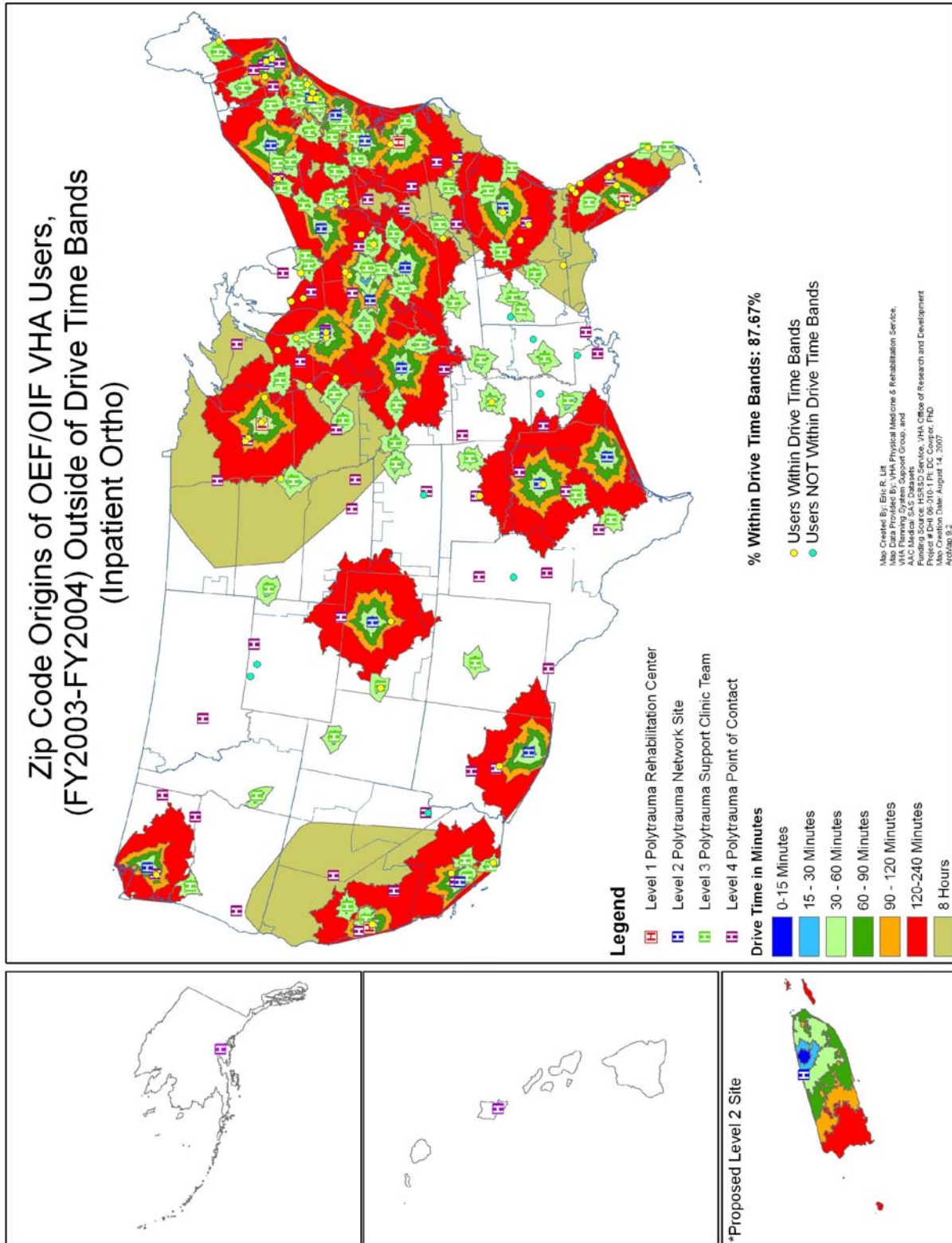
D. Highlights

- Patients with traumatic brain dysfunction had a relatively high rate of polytrauma. Ninety-three (93) of the 332, or 32.8%, had diagnostic codes in TBI plus one or more of the other traumatic injuries under review
- Similar to the traumatic amputation and the burn groups, patients with TBI are relatively young. Individuals less than 25 years of age represent 45.2% of this impairment group. The mean age is 29.1 years
- 93.4% of troops with TBI is male
- African-Americans account for 13% of the TBIs and Hispanic represent 10.8%. Whites comprise 68.7% of this group
- Two hundred fifty (250) inpatient episodes of care were generated at VHA by this group over a one-year follow-up period. Over fifty percent (50.8%) had bed section codes of 20 (Rehabilitation Medicine), 41 (Rehabilitation Medicine Observation), or 35 (GEM Rehabilitation) indicating receipt of rehabilitation
- One-quarter (24.6%) of outpatient visits were to either a rehabilitation clinic or the patient was seen by a rehabilitation professional
- Reasonable access to rehabilitation services was 86% for TBI inpatients and 87% for TBI outpatients

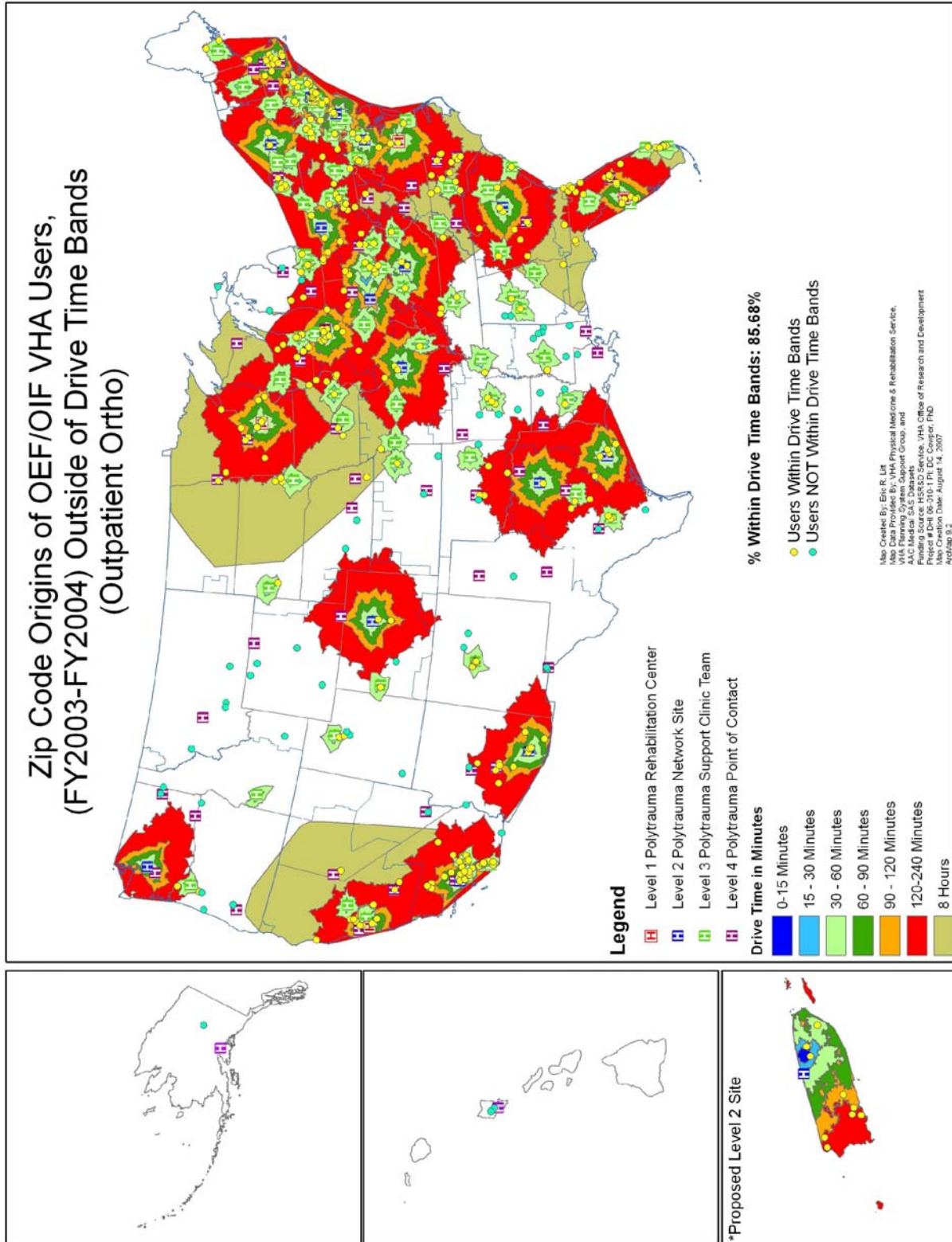
VIII. Orthopedic Impairment Group

A. Characteristics of OEF/OIF Cohorts: Orthopedic Impairment Group			
VARIABLE TYPE	FY03 N=100	FY04 N=307	Combined N=407
Number of Traumatic Injuries			
1 (ORTHO)	89 (89.0%)	249 (81.1%)	338 (83.1%)
2 (ORTHO + 1 additional)	10 (10.0%)	48 (15.6%)	58 (14.3%)
3 (ORTHO + 2 additional)	1 (1.0%)	8 (2.6%)	9 (2.2%)
4 (ORTHO + 3 additional)	0	2 (.65%)	2 (.49%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	85 (85.0%)	282 (91.9%)	367 (90.2%)
Mean Age (standard deviation)	31.0 years (8.9)	29.2 years (8.4)	29.6 years (8.6)
Age Categories (N/%)			
Less than 25	27 (27.0%)	131 (42.7%)	158 (38.8%)
25 – 34	45 (45.0%)	97 (31.6%)	142 (34.9%)
35 – 44	19 (19.0%)	60 (19.5%)	79 (19.4%)
45 – 54	7 (7.0%)	14 (4.6%)	21 (5.2%)
55 and over	2 (2.0%)	5 (1.6%)	7 (1.7%)
Race			
White	69 (69.0%)	218 (71.0%)	287 (70.5%)
Black	15 (15.0%)	29 (9.5%)	44 (10.8%)
Hispanic	11 (11.0%)	44 (14.3%)	55 (13.5%)
Other	4 (4.0%)	11 (3.6%)	15 (3.7%)
Missing	1 (1.0%)	5 (1.6%)	6 (1.5%)
<i>Distance</i>			
Median Dist. to nearest VA facility	15.7 miles	25.0 miles	24.0 miles
Median Distance to nearest Level 3	55.0 miles	54.0 miles	54.0 miles
Median Distance to nearest Level 2	128.4 miles	128.0 miles	128.0 miles
Median Distance to nearest Level 1	339.0 miles	365.0 miles	351.0 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	8	99	107
% rehabilitation	25.0%	16.2%	16.8%
Outpatient Visits (Total)	1,063	4,545	5,608
% rehabilitation	21.4%	24.1%	23.6%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Orthopedic)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Orthopedic)



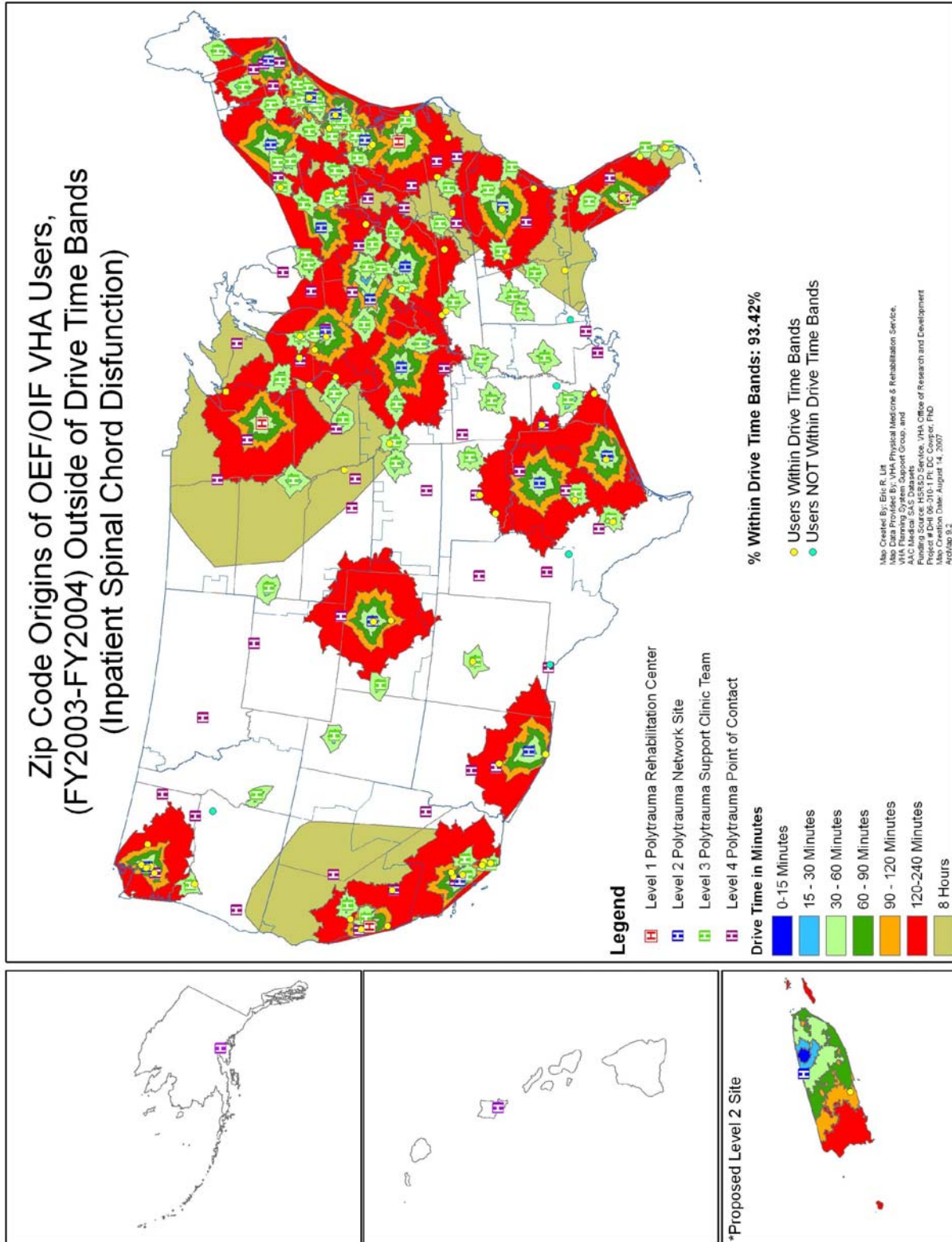
D. Highlights

- Orthopedic conditions are the third largest trauma group studied with 407 patients in the combined FY03-FY04 cohort
- Females represent almost ten percent (9.8%) of the orthopedic impairment group
- The mean age of this group is 29.6 years
- Roughly 30% of this group is minority
- The percentage of inpatients and outpatients within reasonable drive time to rehabilitation services is 88% and 86% respectively

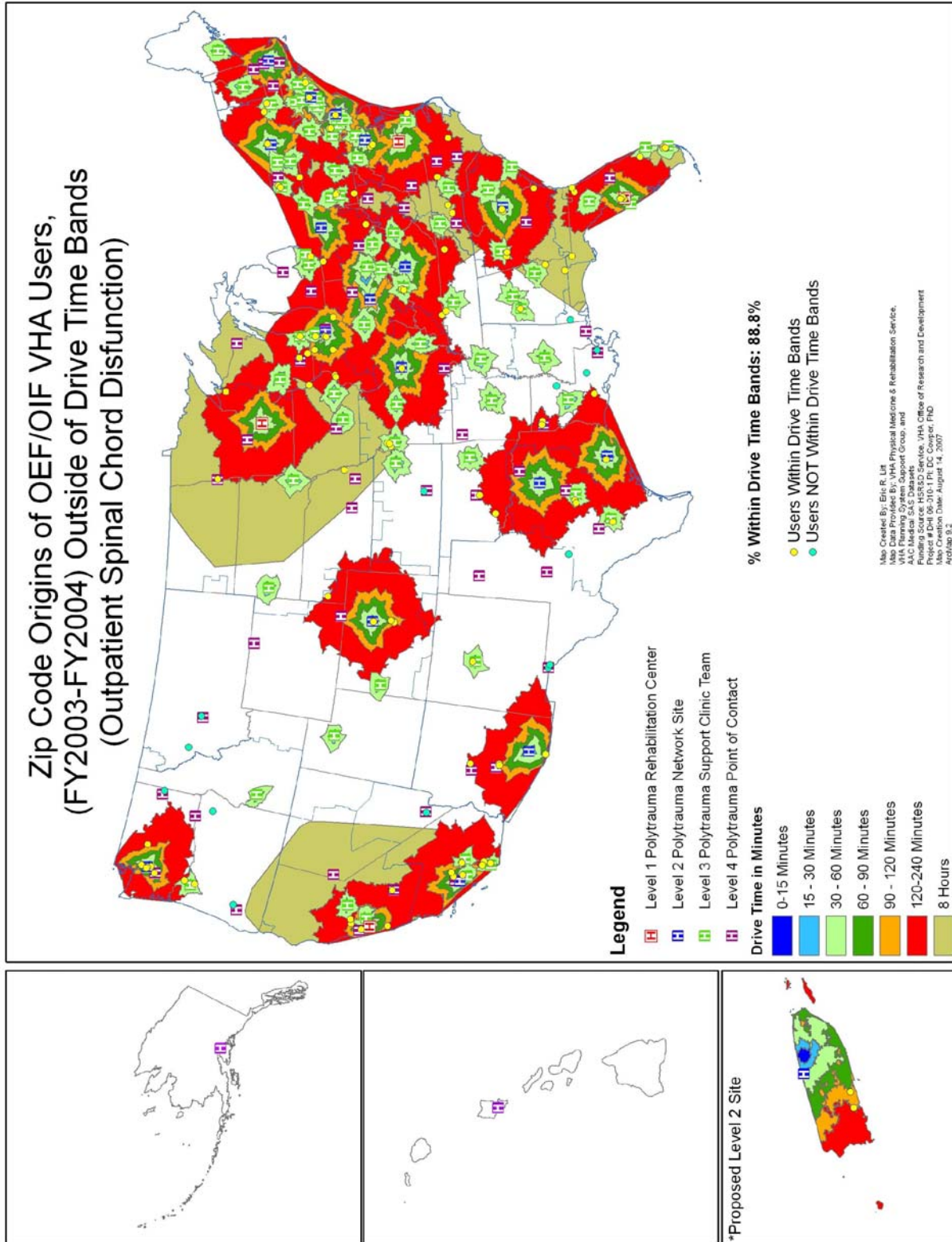
IX. Traumatic Spinal Cord Dysfunction

A. Characteristics of OEF/OIF Cohorts: Spinal Cord Dysfunction Impairment Group			
VARIABLE TYPE	FY03 N=48	FY04 N=77	Combined N=125
Number of Traumatic Injuries			
1 (SCD)	34 (70.8%)	53 (68.8%)	87 (69.6%)
2 (SCD + 1 additional)	14 (29.2%)	18 (23.4%)	32 (25.6%)
3 (SCD + 2 additional)	0	5 (6.5%)	5 (4.0%)
4 (SCD + 3 additional)	0	1 (1.3%)	1 (.80%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)	45 (93.8%)	71 (92.2%)	116 (92.8%)
Male			
Mean Age (standard deviation)	35.2 years (11.5)	30.0 years (8.0)	32.0 years (9.8)
Age Categories (N/%)			
Less than 25	12 (25.5%)	26 (33.8%)	38 (30.4%)
25 – 34	14 (29.2%)	28 (36.4%)	42 (33.6%)
35 – 44	10 (20.8%)	19 (24.7%)	29 (23.2%)
45 – 54	8 (16.7%)	4 (5.2%)	12 (9.6%)
55 and over	4 (8.3%)	0	4 (3.2%)
Race			
White	34 (70.8%)	46 (59.7%)	80 (64.0%)
Black	7 (14.6%)	16 (20.8%)	23 (18.4%)
Hispanic	5 (10.4%)	11 (14.3%)	16 (12.8%)
Other	1 (2.1%)	2 (2.6%)	3 (2.4%)
Missing	1 (2.1%)	(2.6%)	3 (2.4%)
<i>Distance</i>			
Median Dist. to nearest VA facility	17.5 miles	21 miles	18 miles
Median Distance to nearest Level 3	73.5 miles	54 miles	58 miles
Median Distance to nearest Level 2	136 miles	154.2 miles	154 miles
Median Distance to nearest Level 1	404.6 miles	373 miles	390 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	55	77	132
% rehabilitation	9.0%	6.5%	7.5%
Outpatient Visits (Total)	1,155	2,235	3,390
% rehabilitation	33.8%	36.6%	35.6%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Spinal Cord)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Spinal Cord)



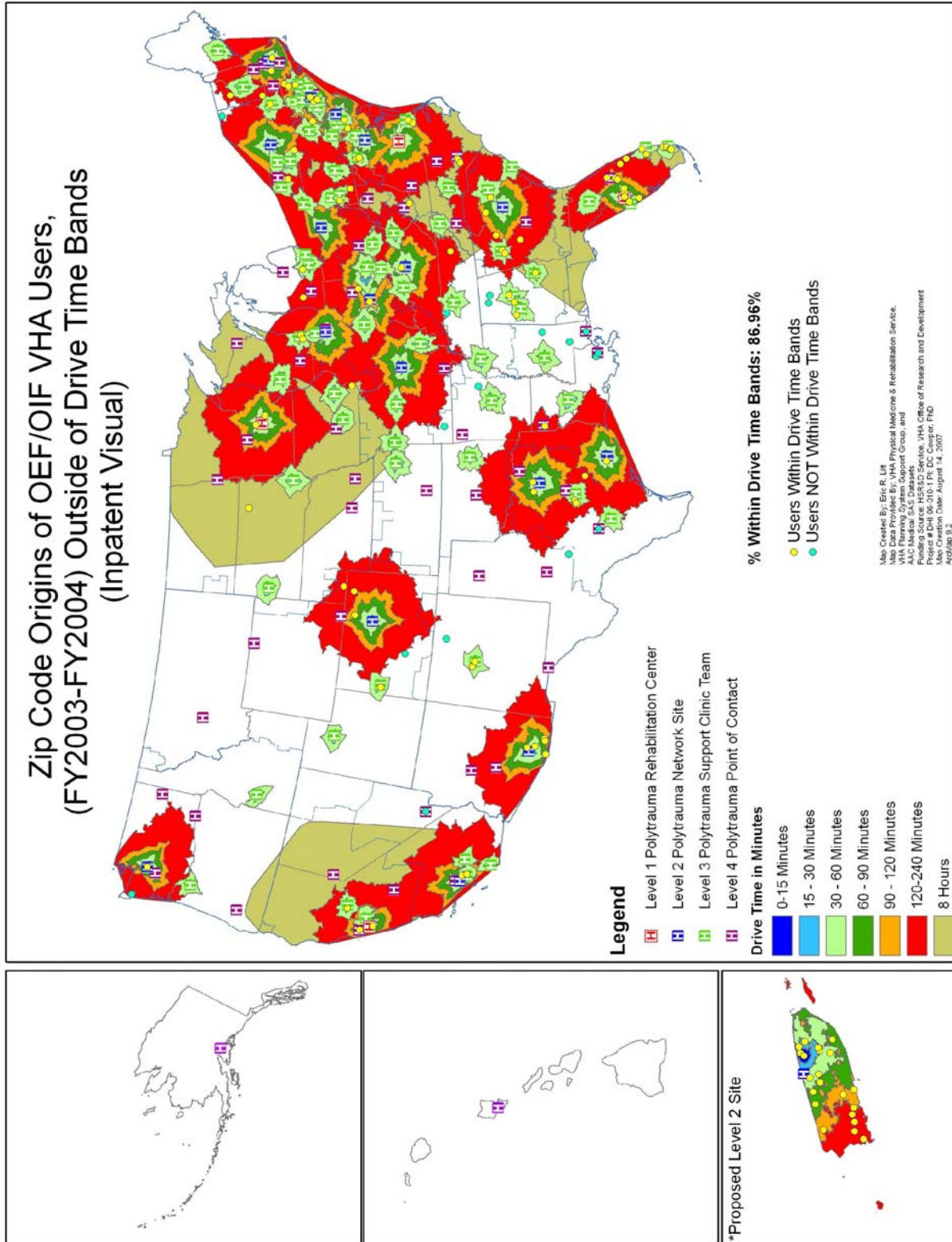
D. Highlights

- Polytrauma injury is relatively high in the traumatic spinal cord dysfunction impairment group; over thirty percent (30.4%) had both spinal cord injury plus at least one of the other traumatic injuries investigated
- The mean age of patients with Spinal Cord Dysfunction was 32.0 years
- Sixty-four percent (64.0%) of patients in this group is White; 18.4% is African American; and 12.8% is Hispanic
- Over one-third (35.6%) of the rehabilitation outpatient visits (3,390) that were generated by this group as a whole in a 12 month follow-up period was to a rehabilitation clinic or to a rehabilitation professional
- Spinal Cord Dysfunction inpatients and outpatients within reasonable drive time distance to rehabilitation services is 93% and 89% respectively

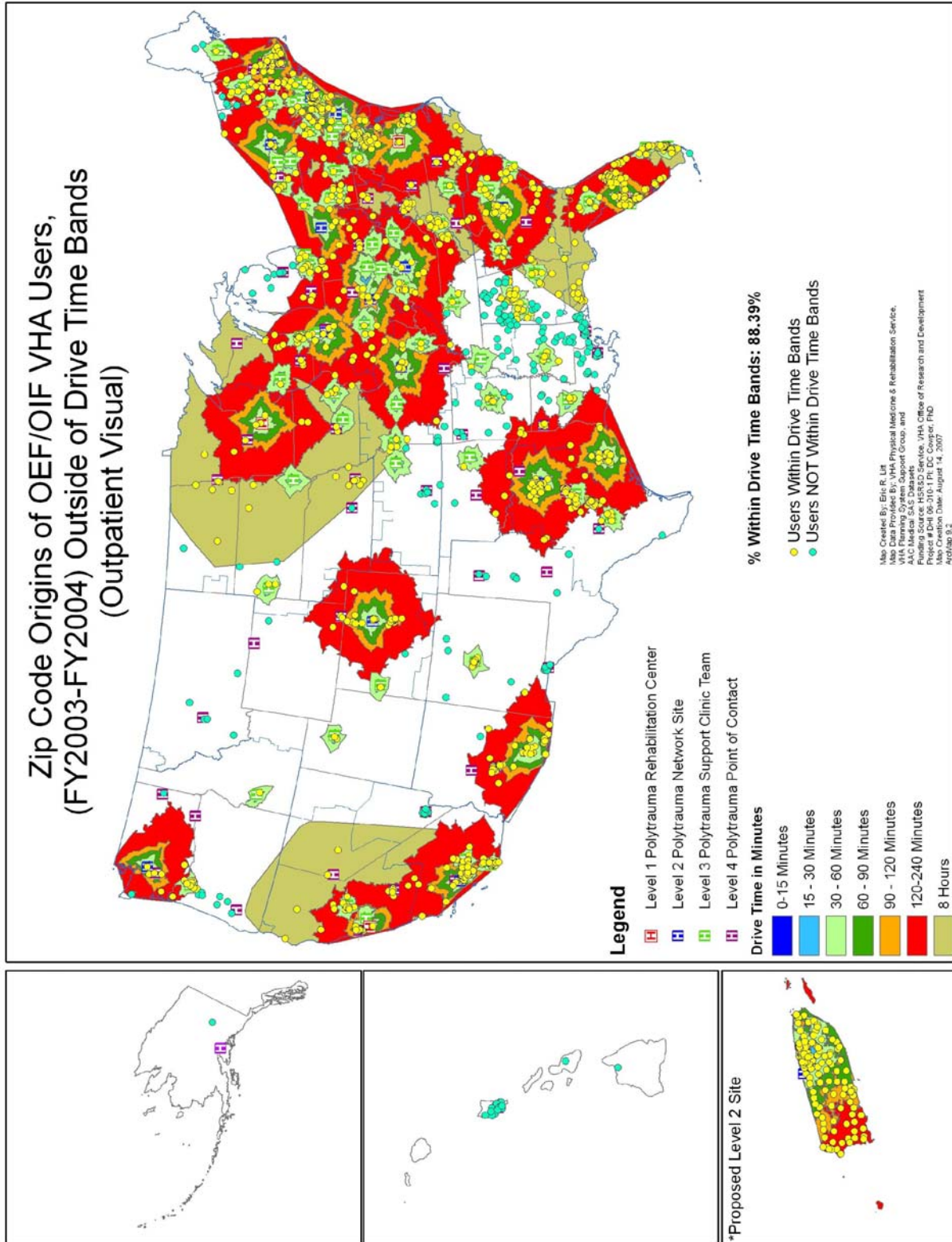
X. Visual Impairment Group

A. Characteristics of OEF/OIF Cohorts: Visual Impairment Group			
VARIABLE TYPE	FY03 N=587	FY04 N=1600	Combined N=2187
Number of Traumatic Injuries			
1 (VISION)	528 (90.0%)	1,371 (85.7%)	1,899 (86.8%)
2 (VISION + 1 additional)	55 (9.4%)	212 (13.3%)	267 (12.2%)
3 (VISION + 2 additional)	4 (.68%)	14 (.88%)	18 (.82%)
4 (VISION + 3 additional)	0	3 (.19%)	3 (.14%)
<i>Demographic Characteristics</i>			
Gender (N/% Male)			
Male	537 (91.5%)	1,398 (87.4%)	1,935 (88.5%)
Mean Age (standard deviation)	39.7 years (10.3)	36.3 years (10.5)	37.2 years (10.6)
Age Categories (N/%)			
Less than 25	76 (13.0%)	327 (20.4%)	403 (10.6%)
25 – 34	104 (17.7%)	384 (24.0%)	403 (18.4%)
35 – 44	188 (32.0%)	484 (30.3%)	488 (22.3%)
45 – 54	189 (32.2%)	359 (22.4%)	672 (30.7%)
55 and over	30 (5.1%)	46 (2.9%)	548 (25.1%)
			76 (3.5%)
Race			
White	255 (43.4%)	614 (38.4%)	869 (39.7%)
Black	120 (20.4%)	337 (21.1%)	457 (20.9%)
Hispanic	181 (30.8%)	588 (36.8%)	769 (35.2%)
Other	18 (3.1%)	43 (2.7%)	61 (2.8%)
Missing	13 (2.2%)	18 (1.1%)	31 (1.4%)
<i>Distance</i>			
Median Dist. to nearest VA facility	18.0 miles	25.0 miles	23.0 miles
Median Distance to nearest Level 3	87.0 miles	98.0 miles	96.2 miles
Median Distance to nearest Level 2	84.0 miles	88.0 miles	87.0 miles
Median Distance to nearest Level 1	483.0 miles	521 miles	512.0 miles
<i>12 Month Utilization</i>			
Inpatient Episodes (Total)	51	130	181
% rehabilitation	5.9%	15.4%	12.7%
Outpatient Visits (Total)	5,843	23,017	28,860
% rehabilitation	9.0%	8.6%	8.7%

B. Zipcode Origins of Inpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Visual)



C. Zipcode Origins of Outpatients Inside and Outside of Drive Time Bands FY03 & FY04 (Visual)



D. Highlights

- Visual impairment is the second largest group studied with 2,187 individuals in the combined FY03-FY04 cohort
- Relatively few patients with a visual impairment code had another polytraumatic injury (13.2%)
- This impairment group has a relatively high percentage of women; females represent 11.5% of all individuals in this group
- The mean age for this impairment group is 37.2 years, the oldest subgroup under investigation; there were 548 individuals in the age group 45-54 and 76 people 55 years of age and older
- OEF/OIF returnees less than 25 years of age represent only 10.6% of this impairment group
- The racial composition of this impairment group is strikingly different than the other impairment groups: 39.7% is White, 20.9% is African American, and 35.2% is Hispanic. Minority representation is largest in this group than in any other traumatic injury subgroup
- Eight-seven percent (87%) of inpatients and 88% of outpatients with visual impairment were in reasonable driving time to rehabilitation services

XI. Recommendations

Based on the findings from this study, two specific recommendations are presented that may help decrease access barriers for traumatically injured OEF/OIF veterans in the future:

1. For counties with potential gaps, as evidenced by more than 10 individuals outside of reasonable drive times to rehabilitation services, an inventory of VHA facilities in or near the county should be created, along with the number and types of rehabilitation staff.
 - Based on the number of patients outside reasonable drive time, the rehabilitation capacity of VHA facilities in a county, and other community resources available, sites should be rank-ordered in terms of priority for rehabilitation level upgrades;
 - These priority ranked facilities should be forwarded to Patient Care Services and the Under Secretary for Health.
2. The residential location of traumatically injured veterans should be monitored on at least an annual basis to identify additional potential gaps in service.
 - With the methodology used in this study, Physical Medicine & Rehabilitation Service should request a regular data feed from the OEF/OIF roster that includes patient ZIP code;
 - Merges with the Medical SAS inpatient, outpatient, and extended care files should be conducted on at least an annual basis to identify traumatic injured veteran subgroups who may have rehabilitation needs;
 - GIS should be employed to map patient location vis-à-vis VHA facilities, and to identify new potential gaps in rehabilitation services.